Notes.

The new session of Parliament was opened by the King in person on Tuesday. Reference was made in the King's Speech to a measure to be introduced into the House of Commons "to deal with the safeguarding of essential key industries of the country, and with certain aspects of unfair and abnormal industrial competition."

A MEETING of the organising committees of all the Sections of the British Association will be held at Burlington House on Friday, February 25, to consider possible arrangements for joint programmes and related matters for the Edinburgh meeting of the Association in September next. Dr. Ethel Thomas, recorder of Section K (Botany), asks us to say that she would be glad to hear as soon as possible before February 25 from those who propose to offer papers for the Edinburgh meeting, and no doubt the recorders of other Sections would like to receive similar early notice.

SUPPORT for the appeal for the protection of the optical glass industry which appeared as a leading article in NATURE of February 10 comes in the form of a series of resolutions passed by the Optical Society at its general meeting on the same date. The importance of optical munitions is emphasised, and it is pointed out that such supplies can be maintained only if the necessary materials, manufacturing establishments, and skilled labour are available. No other industry can by adaptation of existing resources produce the class of work required. The supply of optical glass required by this country should also be ensured. Another point made is that although the world's pre-war demand for optical glass was only about 25 tons per annum, some sixty different varieties are required; experience has shown that manufacture under these conditions cannot be a commercial proposition. In conclusion, it is urged that, in the interest of research, no obstacle should be allowed to prevent men of science from obtaining the instruments necessary for their work. The society is convinced that the optical industries of this country must be preserved and developed, and the President of the Board of Trade is to be asked to receive a deputation to explain more fully the position of these industries.

THE gold medal of the Royal Astronomical Society was presented on February 11 to Prof. H. N. Russell for his work on the theory of star-development. The retiring president, Prof. A. Fowler, recalled in his address that Prof. Russell had introduced them in that very room to the giant and dwarf theory nearly eight years ago. Although a theory on the same lines (the division of the stars into two groups in which the temperature is rising and falling respectively) had been proposed many years earlier by Sir Norman Lockyer, it ran so counter to the then accepted views that he (Prof. Fowler) acknowledged that he had remained unconverted for some time; but recently several lines of evidence have converged to support the truth of the theory, namely, (1) the accumulation of additional parallaxes, both visual and spectroscopic; (2) the theoretical researches of Prof. Eddington and others on the physics of giant stars and the correlation of temperature with mass; and (3) the recent optical confirmation of the immense bulk of the typical red giant star Betelgeux. There is now little dispute as to the main lines of the theory, though there is room for much further work, in which Prof. Russell is taking a prominent part, on the problem of the nebulæ and Wolf-Rayet stars and their place in the scheme of development. Prof. Russell, in returning thanks, expressed his indebtedness to Prof. E. C. Pickering for determining the spectral type of his parallax stars, and noted that Prof. Hertzsprung and himself had put forward the theory simultaneously.

IN recent years M. l'Abbé Breuil has contributed to *L'Anthropologie* a series of memoirs on the rock-paintings of Spain. In the last of these (June, 1920) he sums up the general results to which his studies have led him, and states his belief that all known examples can be arranged in an evolutionary series dating from the closing phases of the Ice age to the dawn of the Neolithic period. In a lecture given at the Institut Français, Cromwell Gardens, S.W., on February 9, the Abbé exhibited a series of original slides illustrating the remarkable art which flourished in southern France and throughout the Spanish Peninsula during the age of the Reindeer, and summed up for his hearers the conclusions reached after many years of systematic investigation. He believed that in the region covered by the art of the cave-men three centres or localities of independent or semi-independent development could be distinguished, North Spain and South-West France forming one centre, East Spain a second, and South Spain a third. The paintings and engravings in the first and second of these cave-areas were, he believed, the work of different peoples, although both were hunters, both giving graphic and realistic representations of the animals they followed and captured, the mammoth, reindeer, bison, and horse. In South Spain, on the other hand, the influence of a pastoral people was to be observed on cave art; it is in this centre that the final degradation of the earlier realistic art of the north into the later linear, conventional form of the south could be detected. There seems reason to believe that it may be possible to trace the evolution of an alphabetical system from the original graphic art of the earlier cave-men. The cave art of South Spain has many points in common with the art of the Bushmen of South Africa.

OWING to the recent decision of the Government that, for the present, no new schemes which involve the expenditure of public money shall be proceeded with, the Ministry of Agriculture and Fisheries informs bee-keepers that no further progress can be made at present with the Bee Disease Bill which was introduced into the House of Lords on December 20 last. The Ministry has also been making preliminary arrangements for the establishment of a Bee Advisory Committee which, it was hoped, would represent thoroughly every section of the bee-keeping industry; its function would be to advise the Ministry on all apicultural matters, including the question of legislation respecting bee diseases. In view of the need for economy and for the postponement of legislation, it will be necessary to delay the formation of this Committee. In the meantime, it is hoped that bee-keepers will take steps to organise themselves in order to arrive at a means of expressing an agreed opinion on the measures to be taken for the protection and furtherance of the industry. Arrangements for the examination of diseased bees no longer exist at the Department of Comparative Anatomy, The Museum, Oxford. Pending the appointment by the Ministry of a bacteriologist to undertake such work, Dr. J. Rennie has kindly consented to carry out examinations and to furnish reports to the bee-keepers concerned. In future, therefore, specimens, together with the name and address of the sender, should be sent to Dr. J. Rennie, Marischal College, University of Aberdeen.

SIR ROBERT HORNE, President of the Board of Trade, in opening on February 10 the Efficiency Exhibition organised by the *Daily Mail* at Olympia, referred to the importance of science and research to industry. In the past we had been too much accustomed to develop business without regard for the sciences or arts; now that attitude is passing away, and the sciences, arts, and industry are working well together. As examples of the success which has attended the co-ordination of effort, Sir Robert mentioned the Dorman appliances for the transmission of wave-energy through water, and the progress which has been made in preserving the health of the nation. We are compelled to defer an account of some of the exhibits of scientific interest until next week, but wish now to direct particular attention to the stand organised by London University, on which Prof. Fleming has arranged a number of the original valves and lamps used by him when he was evolving the thermionic valve. The series enables a view to be obtained of the genesis of one of the most valuable of modern inventions, which was itself the outcome of purely scientific research.

SIR ERNEST SHACKLETON, the *Times* announces, is planning a two years' expedition to Arctic regions, and proposes to leave England in May or June next, accompanied by a dozen men chosen chiefly from those who accompanied him on former expeditions. He proposes to sail for Hudson's Bay, where 150 dogs will be embarked, and then to proceed, *via* Baffin's Bay, through Lancaster Sound to Axel Heiberg Land. The passage of Lancaster Sound and Barrow Strait and the course to be followed to the northward must depend largely on ice conditions. The main object of the expedition is said to be to explore the region between Axel Heiberg and the Parry Islands. Parts of this area were explored between 1898 and 1902 by Otto Sverdrup's expedition in the *Fram*, when surveys were made by G. Isachsen of the coasts of Axel Heiberg, Ellef Ringnes, and Amund Ringnes Lands. Stefansson, travelling from Prince Patrick Island, visited the region in 1915 and 1916, and discovered two new islands in the Gustav Adolf Sea and one in the Prince Gustav Sea, besides finding that Ellef Ringnes Land is in reality two islands. The American Crocker Land Expedition under Mr. D. B. Macmillan in 1916 reached King Christian Island, travelling south-westward from Ellesmere Land. A great deal of work, however, remains to be done, and there is little doubt that Sir Ernest Shackleton intends to push eastward into the unknown Beaufort Sea, where land possibly exists, although Peary's Crocker Land has been disproved and Stefansson has found a relatively narrow continental shelf. It is reported that Sir Ernest Shackleton has bought the Norwegian whaling vessel *Foca I.*, which will shortly leave Tromsö for England. For some years this vessel has been used in carrying stores and men to Spitsbergen for a Norwegian mining company.

SIR LYNDEN MACASSEY in his address on February 11 to the Institute of Industrial Administration upon present-day industrial psychology attributed our present industrial discontent (i) to the failure of Capital to give sufficient attention to the question of administration, and (ii) to the lack of economic information, both general and particular to their respective industries, among the workers. He pleaded for a re-valuation of the factors of production so as to reach a nobler conception of the responsibilities and possibilities of administration. It will be generally agreed that in the past far too much has been left to chance, and that the time has come when this side of our industrial life must be completely overhauled. There may, perhaps, be less general agreement with Sir Lynden's view that a second condition of securing efficiency in production is that Labour shall be regarded as entitled to "know the facts," obtained from an efficient costing system, about the industries in which it is engaged. Yet facts of this kind have infinitely greater weight than an unsupported statement of the management in which, unfortunately, the men have probably little or no faith. Sir Lynden is inclined to underestimate the extent to which welfare work is regarded with suspicion, and his suggestion for its extension will meet with considerable criticism from those who are demanding that they shall be allowed an increased share in all branches of management.

THOUGH the various British firms which are specialising in the manufacture of organic research chemicals continue to add from time to time to the range of products made, their lists are still far behind those issued by the German firms before the war in the variety and complexity of organic chemicals offered. The slow progress made is due to difficulties with which all chemists have become familiar since 1914, and not the least of these is the uncertainty of the Government policy towards the fine chemical industry as a whole. Meanwhile, research work must go on, and since the date of the Sankey judgment research chemists have again begun to make use of German sources of supply, which, it may be added, are no longer so abundant, cheap, and various as they were in 1914, though they appear to be rapidly improving. As it seemed possible that the Dyestuffs (Import

Regulation) Act, 1920, might interfere with the importation of such chemicals, the council of the Institute of Chemistry addressed a letter to the Board of Trade inquiring whether licences would be necessary for the import of small quantities of organic chemicals (including intermediate products used in the manufacture of dyes, etc.) required solely for research purposes. The Board of Trade in its reply states that whilst it is not possible to regard small quantities of organic intermediate products which may be required for research purposes as being outside the scope of the Act, the Board will be prepared to issue general licences for the importation of such products to approved research institutions, covering periods of three months and limited only as to total quantities. This procedure obviates the necessity of separate applications for a large number of small items, but it will be a condition of the issue of such a general licence that a detailed return shall be furnished, at the end of the three months during which the licence is in operation, of the quantities of each product actually imported under it. This ruling indicates that the authorities are prepared to interpret the Act in such a way as not to hamper the prosecution of research.

THE Parkin prize, value 100*l*., will be offered by the Royal College of Physicians of Edinburgh for the best essay "On the Effects of Volcanic Action in the Production of Epidemic Diseases in the Animal and in the Vegetable Creation, and in the Production of Hurricanes and Abnormal Atmospheric Vicissitudes." Essays intended for competition, which is open to competitors of all nationalities, must be written in English, and must reach the secretary not later than December 31, 1921. Each essay must bear a motto, and be accompanied by a sealed envelope bearing the same motto outside and the author's name inside.

THE Department of Scientific and Industrial Research has approved the formation of a Research Association for the Cast Iron and Allied Industries as complying with the conditions laid down in the Government scheme for the encouragement of industrial research. The secretary of the committee engaged in the establishment of this association is Mr. Thomas Vickers, 174 Corporation Street, Birmingham.

WE learn from the *British Medical Journal* of February 12 that an institute of biology named after Ramon y Cajal has been established at Madrid. It consists of four sections, devoted to human and comparative histology, neurology, physiology, and experimental pathology respectively.

Our Astronomical Column.

IONISATION IN THE SUN.—Two papers by Dr. Megh Nad Saha have recently appeared in the *Phil. Mag.* (vol. xl., pp. 472, 809), in which the author suggests an explanation of the varying character of the spectra exhibited by different elements in the sun. It is well known that some elements are represented by both enhanced and arc lines. Others show enhanced lines only, while a few have not been found at all. Prof. Fowler has ascribed these variations very largely to the different atomic weights of the elements concerned, but Dr. Saha is of the opinion that atomic weight is only of minor importance, being largely balanced by selective radiation pressure, and regards the variations mentioned above as arising from the different responses of elements to the stimulus existing in the sun. The enhanced lines are assumed to be due to radiations from "ionised atoms" (*i.e.* atoms that have lost an electron) rather than to a mere increase in temperature, and the different ionisation potentials of the elements will thus cause their varying behaviour. Calculations are given of the percentage ionisation of various elements at different temperatures and pressures. The results certainly agree quite well with the observed differences of behaviour of the elements chosen, and also with their individual variations in different regions of the sun.

THE FIRST VOYAGE ROUND THE WORLD.—Prof. Pio Emanuelli, of the Vatican Observatory, contributes an article to the *Corriere d'Italia* of December 20 last on the voyage of Magellan four hundred years ago. Magellan sailed from Spain on September 20, 1519, with five ships. He stayed in Brazil for some months, during which, as his biographer Pigafetta tells us, the potato was tasted for the first time by Europeans. On the resumption of the voyage to the south the Straits of Magellan were discovered and traversed, the ships reaching the Pacific on November 28, 1520. On April 27, 1521, Magellan and several of his companions were treacherously slain in the Island of Zebu, in the Philippines. Some of the ships were captured, while others had to be abandoned owing to insufficient crews. Only one ship, the *Victoria*, returned to Spain, arriving on September 6, 1522, with the 18 survivors of the expedition, which had originally numbered 237.

Prof. Emanuelli notes that the first clear and definite description of the Magellanic clouds dates from this expedition. Thus they deservedly perpetuate Magellan's name in the heavens. Attention is also directed to the fact that until this voyage the geography of the earth as a whole was less well known than that of the planet Mars at the present day.

SECULAR CHANGE IN THE PERIOD OF δ CEPHEI.—Prof. Eddington, in studying the pulsation theory of the Cepheids, indicated that a fairly rapid secular change of period was to be expected, and referred to Hertzsprung's conclusion that the period of δ Cephei was diminishing by 0·079s. per annum. Mr. H. Ludendorff gives a further discussion of the early observations in *Ast. Nach.*, No. 5076. He has carefully re-reduced the original observations of Mr. F. M. Schwerd, made between 1823 and 1826, and finds that they accord closely with the change of period announced by Hertzsprung. The formula of the latter gives a shift of the time of maximum amounting to −0·0121 of a period in 1825, while Schwerd's observations give −0·0134 ± 0·005. The following values of the shift as given from other early series of observations are deduced:—Goodricke, 1785: shift −0·036 × period ± 0·005; Pigott, 1785: shift −0·035 × period ± 0·011; Westphal, 1818: shift −0·010 × period ± 0·008. Mr. Ludendorff considers that the reality of the change is placed beyond doubt by this discussion.